

Error Control and Flow Control

1. In Stop-and-Wait ARQ why should the receiver always send an acknowledgment message each time it receives a frame with the wrong sequence number?
2. Draw the sender and receiver windows (size 7) and show the operation for a system using Go-Back-N ARQ, given the following:
 - a. Frame 0 is sent; Frame 0 is acknowledged.
 - b. Frames 1 and 2 are sent; Frames 1 and 2 are acknowledged.
 - c. Frames 3, 4, and 5 are sent; Frame 4 is acknowledged; timer for frame 5 expires.
 - d. Frames 5, 6, and 7 are sent; Frames 4 through 7 are acknowledged.
3. Bob from RMIT sends few MP3 files electronically to John at Monash University using Go-Back-N ARQ. The transmission link between RMIT and Monash is mostly noisy. Bob finds Go-Back-N ARQ to be very inefficient for a noisy link and decides to switch to Selective Repeat ARQ. Did Bob make the right decision? If so, explain why Go-Back-N ARQ is very inefficient in a noisy link, but Selective Repeat ARQ is found to be more efficient for the same link.
4. Consider the use of 1000-bit frames on a 1-Mbps satellite channel with a 270-ms delay. What is the maximum link utilization for
 - a. Stop-and-Wait flow control
 - b. Continuous flow control with a window size of 7?
 - c. Continuous flow control with a window size of 127?
 - d. Continuous flow control with a window size of 255?